

Lecture 32

P, NP

Two Sides of Computation

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Possibility

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Impossibility

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Possibility: Algorithms

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Impossibility: Complexity Theory

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Deals with creating efficient algorithms for computational problems.

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Mostly decision problems.

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DEC_PATH: Given a graph G and vertices $u, v \in G$, decide if a path from u to v exists.

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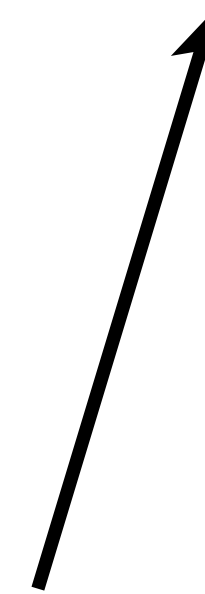
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Note: We will assume that in the problems an **input** is always provided in **encoded binary form**.

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 Decision problems can be expressed as sets.

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The polytime algorithm you have in your mind is actually an exponential time algorithm.

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Note: NP stands for **nondeterministic polynomial time**.